

Lubrication

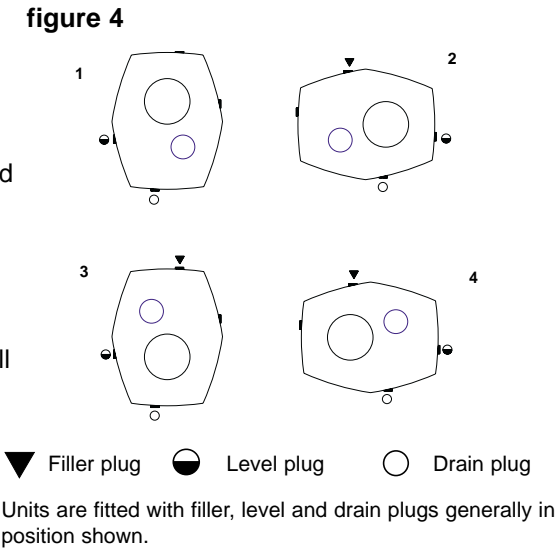
IMPORTANT

The reducer is despatched without oil. It must be filled as instructed before running. Use high grade oil as stated below. Fill to level plug when reducer is not running. The approximate quantities are shown in table below. Drain, flush and refill every six months of operation, check oil level regularly. Positions of filler, breather and drain plug for different mounting positions are shown in fig. 4.

CAUTION

Too much oil will cause over-heating. Too little oil will cause gear failure.

Health and Safety at Work Act 1974
Attention is drawn to the “Codes of Practice” issued by oil companies in respect of the handling of their products.



Approximate oil quantities required for different mounting positions (see figure 4)

Unit Size	Approximate Capacity - Litres							
	5:1				13:1, 20:1 & 25:1			
	1	2	3	4	1	2	3	4
015	0.3	0.3	0.3	0.4	0.25	0.4	0.3	0.4
103	0.5	0.5	0.5	0.6	0.4	0.6	0.5	0.6
107	0.8	0.9	0.8	1	0.7	0.9	0.8	0.9
115	1.2	1.7	1.4	1.8	1	1.8	1.4	1.6
203	2.5	2.6	2.4	2.5	2.3	2.6	2.4	2.2
207	3.3	3.2	3.2	3.3	3	3.2	3.2	3.2
215	4.1	5.3	4.1	5.8	3.8	5.5	4.2	5.1
307	5.7	8.6	5.9	8.6	5.4	8.5	5.9	8.3
315	10.9	18.4	13.6	18.4	9.1	16.4	12.6	15.4
407	15.2	21.7	25.2	20.7	12.7	21.7	15.7	19.2
415					12.5	13.5	24.0	11.5
507					22.5	34.5	52.0	27.0
608					36.0	50.0	79.0	45.0

Normal operating positions are shown in fig. 4. Note that the reducer is supplied with four plugs. After the reducer has been mounted in its running position, the plugs must be located as shown in fig. 4 for the appropriate mounting position. If the reducer is not within 20° of one of the positions shown, the oil level plug cannot be safely used to check the oil level. This can be overcome by disconnecting the torque-arm and swinging the reducer around to one of the positions shown. Because of the many positions of the reducer it may be necessary, or desirable, to make special adaptations using the plug holes in the reducer with standard pipe fitting, standpipes or oil level gauges.

Recommended Mineral Oil Lubricant Viscosities

	Ambient Temp °C	5:1 Ratio Gearbox				13:1, 20:1 & 25:1 Ratio Gearbox					
		0-100 rev/min	101-200 rev/min	201-400 rev/min	0-20 rev/min	21-50 rev/min	51-120 rev/min	0-50 rev/min	51-80 rev/min		
		015-407	015-407	015-107 115-407	015-407	015-115 203-407	015-115 203-407	415 - 608	415 - 608		
I.S.O.	-10 to +5	100	100	100 68	150	150 150	100 100	100	100		
Viscosity	6 to 25	460	320	320 220	680	680 460	460 320	320	220		
Grade	26 to 40	800	680	680 460	800	800 800	680 460	460	320		

Sumitomo Cyclo Europe recommends:
Mobil Mobilgear 600 series mineral oil
Mobil SHC XMP 320 synthetic oil is suitable for all ambient temperatures and all input speeds

Installation and Maintenance of
SUMITOMO HSM SPEED REDUCERS
SIZES 015 - 608

IMPORTANT

Study these instructions carefully before installing and operating the drive. Make sure that this information is readily available to all persons involved in the operation and maintenance of the drive.

All appropriate safety regulations must be observed when installing a drive.

Suitable safety covers or guarding must be provided for all rotating shafts.

The drive is designed exclusively for use as specified in the catalogue, any other use is considered improper.

The manufacturer accepts no liability for damage as a result thereof.

Before switching on or starting up the machine, make sure that nobody can be endangered by the machine/system startup.

Own modifications and/or alterations which affect the safety of the drive are not permitted.

Spare parts must comply with the technical requirements specified by SUMITOMO. This is always ensured with original spare parts.

Parallel Keyed Hub

IMPORTANT - If a Taper-Grip Bush is being used DO NOT smear the mounting shaft with the anti-fretting compound. Instructions 1 and 2 should not be followed. See page 3 for installation instructions referring to Taper-Grip reducers.

1 Ensure that the shaft onto which the reducer is to be mounted and the reducer bore are clean and free from burrs. Liberally smear the shaft and reducer bore with the contents of the tube which accompanies the reducer. This acts as a lubricant to aid mounting and facilitates easy removal by prevention of fretting and atmospheric corrosion. If the box is to be used with a bushed bore the bushes should now be fitted. Two bushes are supplied, one plain and one split.

The plain bush should always be positioned at the side opposite the input shaft. The split or keyway in the remaining bush must align with the hub keyway.

The bushes can be held in position by inserting the screws found at 120° to the keyway into the bush, care should be taken not to have the screws protruding through the bush. The screws should be fitted as indicated on the leaflet supplied with the bushes.

2 Slide the reducer onto the driven shaft which must pass through the full width.

A key is supplied with the split bush, this should now be fitted. A keywayed bush should be fitted with standard section side fitting keys.

Do not use taper or top fitting keys. Tighten all four screws onto the driven shaft.

3 Install pulley on input shaft as close to the reducer as possible. See fig. 1.

4 Install motor and V-Belt drive with the belt pull at approximately 90° to the centre line between driven and input shafts. See fig. 2. This will permit tensioning of the V-Belt drive with the torque-arm, which should preferably be in tension.

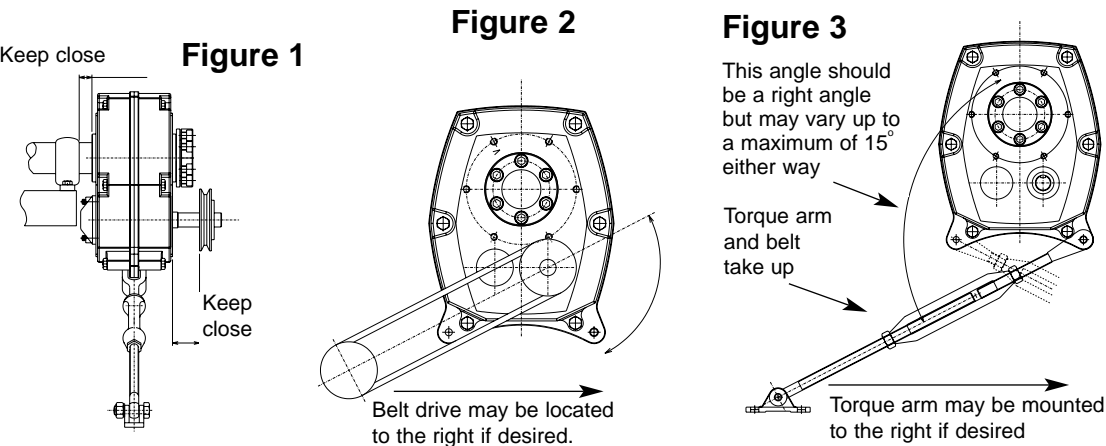
5 Install torque-arm on reducer by placing the forked rod end over the suitable torque-arm case bolt hole and inserting the bolt supplied. Tighten the nut/bolt to the torque stated in the table.

6 Install torque-arm fulcrum on a rigid support so that the torque-arm will be at approximately right angles to the centre line through the driven shaft and the torque-arm case bolt. See fig. 3. Make sure there is sufficient take up in the turnbuckle for belt tension adjustment.

7 Fill with suitable lubricant, see page 4.

Torque arm tightening torques

HSM Size	103 to 107	115 to 203	207 to 415	507	608
Torque (Nm)	20	30	80	480	950



N.B. Backstops: A backstop for mounting inside the reducer to prevent reversal of direction is available for all reducers.

Taper-Grip® Hub

NOTE: Satisfactory performance depends on proper installation. Therefore all instructions must be carefully followed.

FITTING THE REDUCER TO THE SHAFT

- 1. Check the size and condition of the shaft to which the reducer will be fitted. Maximum tolerance is h11 although this should be improved upon where possible. Ensure the shaft and Taper-Grip® bush bore are free from burrs and corrosion. Clean both bore and shaft with solvent to remove all traces of grease and oil.
- 2. Lightly oil the screws and insert into the Taper-Grip® bush ensuring they do not project beyond the rear face.
- 3. Fit the thrust collar onto the Taper-Grip® bush, ensuring it is located on the spigot immediately behind the flange. Screw the Taper-Grip® bush into the hub in a clockwise direction until the thrust collar is trapped between the flange and the reducer hub.
- 4. Unscrew the bush until a gap of approx. 1mm is seen between the flange and the thrust collar (see diagram). Tighten all screws until they are finger tight. On reducers with a keyslot on the end of the hub, ensure that a screw is NOT positioned over the keyslot.
- 5. Slide the reducer onto the shaft at least as far as the counter bore, if present, in the Taper-Grip® bush. Gradually tighten each screw in turn to the torque levels shown in Table 1. If the shaft has passed through the counter bore, grease fill the cavity at the shaft end to prevent the build up of corrosion. Continue installation from step 3 on page 2.
- 6. After the reducer has been running for 20 or 30 hours re-torque the screws to the values in Table 1. Screw torques should be subsequently checked at normal service intervals (i.e. every 6 months).

REMOVING TAPER-GRIP® REDUCER FROM THE SHAFT

Slacken each screw gradually until they are free from the thrust collar. Give the Taper-Grip® bush a sharp tap with a mallet to break the taper, this will free the reducer. Finger tighten two of the screws against the thrust collar to prevent the Taper-Grip® bush locking in the opposite direction as the reducer is removed from the shaft.

If, as a result of shaft corrosion, the bush is difficult to move, any loose corrosion must first be removed. The reducer can then be withdrawn with the aid of a suitable hub drawer attached to the threaded holes on the Taper-Grip® Bush flange.

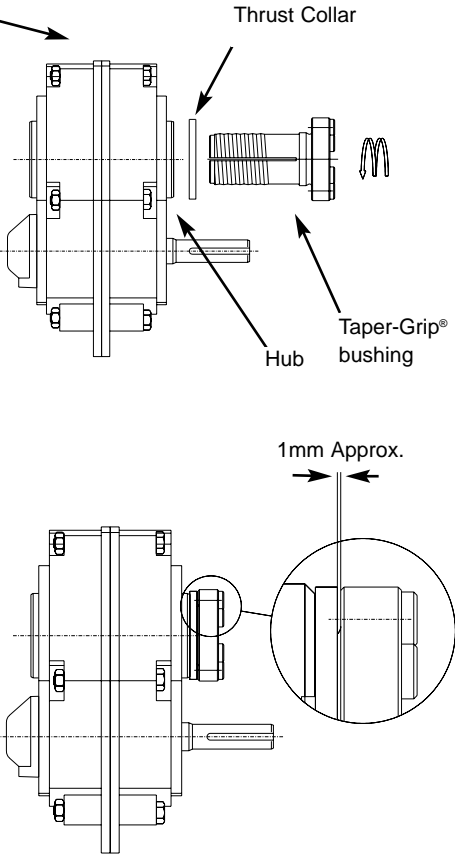


Table 1.

HSM Size	Screw size		Thrust Collar Code	Screw Torque (max) ¹	
	Qty.	Code		Nm	lb ft
015	6xM10	112B700	112B6146	40	30
103	6xM10	112B7003	112C6146	50	37
107	6xM10	112B7003	112D6146	55	41
115	6xM12	112E7003	112E6146	75	56
203	6xM12	112E7003	112F6146	140	104
207	6xM16	112G7003	112G6146	250	185
215	6xM16	112G7003	112H6146	300	223
307	8xM16	112G7003	112J6146	300	223
315	10xM16	112G7003	112S6146	300	223
407	12xM16	112S7003	112K6146	250	185
415	12xM16	112S7003	112K6146	250	185
507	15xM16	112S7003	112L6146	250	185
608	20xM16	112S7003	112M6146	250	185

1. Screw torque can be reduced if required output torque is below catalogue rating